

SEQUESTRATION

semiconductor. An element or compound having an electrical conductivity intermediate between that of conductors and non-conductors (insulators). Most metals have quite high conductivity, while substances like diamond and mica have very low conductivity (high resistance). Between these extremes lie the semiconductors, of which germanium, silicon, silicon carbide, and selenium are examples, with resistivities in the range of 10^{-2} to 10^9 ohms/cm. Slight traces of impurities in the crystalline structure are essential for semiconduction; arsenic is a typical impurity in semiconductor crystals. These impurities function as electron donors or acceptors and the semiconductor is designated n-type or p-type, depending on the electrical nature of the "holes" or energy deficits in the crystalline lattice.

The functioning of semiconductors involves the science of solid state physics. Their discovery in the early 1940s made possible the development of transistors, with their manifold applications in electronic devices, in which they have largely replaced the vacuum tube.

There are a few organic semiconducting compounds which contain a significant amount of carbon-carbon bonding and are also capable of supporting electronic conduction. Anthracene and Ziegler-catalyzed acetylene polymers (conjugated polyolefins) are examples.

See also crystals, impurity, solid, solid state chemistry.

semimicrochemistry. Any chemical method (usually analytical) in which the weight of the sample used is from 10–100 mg.

semipermeable membrane. See membrane, semi-permeable.

semisynthetic. A term often used to describe end-products that are manufactured from natural materials but do not occur in the free state, for example, paper, glass, soap, cement, rayon, leather, etc.

Semmler-Wolff reaction. Rearrangement of α,β -unsaturated cyclohexenyl ketoximes into aromatic amines under acidic conditions.

"**Sentry.**"²¹⁴ TM for sorbic acid and potassium sorbate.

Use: Fungistats for the control of certain molds and yeast in foods. Also TM for propylene glycol, USP. Solvent for flavors and colors; humectant for baked goods, and plasticizer for cork seals and crowns.

"**Separan.**"²³³ TM for a series of flocculating agents. AP30. Synthetic, high molecular weight, anionic polymer. C-90 and C-120. Synthetic,

high molecular weight, cationic polymers. MGL. Similar to NP10. Used in production of uranium. NP10. Synthetic, water-soluble, nonionic, high molecular weight polymer of acrylamide. "Separan" NP 10 potable water grade flocculant has been accepted, subject to maximum use concentration of 1 ppm, by the US Public Health Service. NP20 Nonionic polyacrylamide polymer. PG2 Similar to NP10. Used in paper manufacture.

separation. A collective term including a large number of unit operations which, in one way or another, isolate the various components of a mixture. Chief among these are evaporation, distillation, drying, gas absorption, sedimentation, solvent extraction, press extraction, adsorption, and filtration. Specialized methods include centrifugation, electromagnetic separation (mass spectrograph), gaseous diffusion, and various types of chromatography.

See specific entry for further information.

"**Sephadex.**"⁴⁸⁵ TM for a dry insoluble powder composed of microscopic beads which are synthetic, organic compounds derived from the polysaccharide dextran. The dextran chains are crosslinked to give a three dimensional network and the functional ionic groups are attached to the glucose units of the polysaccharide chains by ether linkages. Available in various forms for use in many different phases of chromatography.

septiphene. See o-benzyl-p-chlorophenol.

"**Septo-Sour.**"⁴⁴ TM for a product consisting chiefly of zinc salts of fluorine compounds. Properties: White, dustless crystals; readily soluble in water; neutralizing value 25.6 oz sodium bicarbonate/lb.

Use: Laundry sour, especially low temperatures.

sequestration. The formation of a coordination complex by certain phosphates with metallic ions in solution so that the usual precipitation reactions of the latter are prevented. Thus, calcium soap precipitates are not produced from hard water treated with certain polyphosphates and metaphosphates (these polyphosphates are often improperly referred to as hexametaphosphates). The term sequestration may be used for any instance in which an ion is prevented from exhibiting its usual properties due to close combination with an added material. Two groups of organic sequestering agents (chelates in these examples) of economic importance are the aminopolycarboxylic acids such as ethylenediaminetetraacetic acid and the hydroxycarboxylic acids such as gluconic, citric, and tartaric acids. In the food